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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/707,922	01/26/2004	Carles Borrego Bel	8136ES	1921
23688	7590	09/11/2007	EXAMINER	
Bruce E. Harang PO BOX 872735 VANCOUVER, WA 98687-2735			PARRIES, DRU M	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/707,922	BORREGO BEL ET AL.	
	Examiner	Art Unit	
	Dru M. Parries	2836	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 July 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3 and 5-15 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3 and 5-15 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION***Response to Arguments***

1. Applicant's arguments filed July 6, 2007 have been fully considered but they are not persuasive. Regarding the "missing limitations", Gronbach (the main reference) teaches a bi-directional converter (22) that is capable of taking voltage from the 14V side (partially provided by battery (24)) and boosting that voltage to charge the 42V side. The Examiner contends that this limitation is not explicitly claimed. Also, Gronbach does teach how to use his converters (20/22) to charge or power the loads of either voltage level via the other voltage level ([0010]). Also, Mahvi teaches the use of a high speed CAN bus in a vehicle. Also, the only modifications taught by the Maeda reference are the ideas of having a plurality of DC/DC converters each corresponding to a specific set of loads and the incorporation of fuses into a vehicle system. The fact that Maeda doesn't have two voltage sources is moot. Also, Akerson teaches a vehicle power system comprising a plurality of bi-directional converters.

2. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

3. In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5

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USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992).

In this case, Gronbach is the main reference and because of the fact that he is silent on the communication bus issue is a good enough reason to search for other references to modify Gronbach. For example, since Gronbach is silent as to the type of communication bus being used, one of ordinary skill in the art that is trying to make or use Gronbach's invention would search through the communication bus art and look for an advantageous communication bus to implement into the Gronbach invention (i.e. Mahvi's bus).

4. In conclusion, Gronbach teaches a dual voltage electrical supply system, a bi-directional converter and the method of providing electrical voltage even during transient changes in the loads. Maeda teaches the use of at least three DC/DC converters and providing fuse protection of the loads. Akerson teaches the use of at least two bi-directional converters, and Mahvi teaches the use of a CAN bus. The motivation for each of these modifications of the Gronbach reference has been given in previous rejections, as well as below.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1, 3, 7, 8, 10, 12, and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gronbach (2003/0155814), Maeda (6,340,848), Akerson (6,344,985), and Mahvi (2003/0036823). Gronbach teaches a vehicle with a dual voltage electrical system comprising two networks at different voltage levels (42V and 14V), where each network can

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feed the other via a bi-directional DC-DC converter (22; [0010])). He also teaches several equal shunted DC/DC converters (20, 22) connecting the first and second networks connected to a common point. Both networks are fed via a battery (12 and 24) and one is connected to a generator (10). He also teaches loads not being able to be fully supported via one source, so converters, and the other network battery, help to provide support to the one network by supplying the extra power needed to supply to the loads ([0010])). He also teaches a control unit which controls the converters output to each load (last of [0012])). Gronbach fails to teach having each converter having its own set of loads nor does he teach protection means in some of the loads of each set. Maeda teaches a power distribution system in a vehicle comprising sets of 14V loads (normal load) and 42V loads (large capacity load) in different parts of the vehicle each connected to a distribution box containing a DC/DC converter corresponding to each set of loads. He also teaches fuses (31f, 31d, 33f, 33d, 35d, 35f) protecting the all loads in each set (Fig. 2). It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate a plurality of DC/DC converters assigned to particular sets of loads to minimize the amount of wires running through the system (Maeda—Col. 5, lines 34-42) and to have more accuracy with different sets of loads. It also would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate fuses into the load side of the converters to protect the loads from overcurrent or overvoltage.

Gronbach fails to teach at least two bi-directional DC/DC converters being used in his electrical system. Akerson teaches an electrical system that could be used in a vehicle having different voltage networks (Col. 1, lines 11-15). He goes on to teach the use of a plurality of bi-directional DC/DC converters (102a, 104a) in the system (Fig. 7). It would have been obvious to

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one of ordinary skill in the art at the time of the invention to incorporate the plurality of bi-directional DC/DC converters of Akerson into the vehicle electrical system of the Gronbach/Maeda combination, so that the system can transfer power in either direction at a plurality of different points throughout the vehicle and therefore would minimize wires and also create a more efficient system in the case where power from one network needs to be supplied to the other at various points throughout the vehicle.

Gronbach also fails to explicitly teach how the control unit communicates with the converters and the rest of the supply system. Mahvi teaches a vehicle control system using a high-speed communications bus, for example, the CAN standard ([0032]). It would have been obvious to one of ordinary skill in the art at the time of the invention to use a CAN high-speed communication bus since they are known to be used in the vehicles art and Gronbach was silent on this issue.

7. Claims 2, 9, and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gronbach (2003/0155814), Maeda (6,340,848), Akerson (6,344,985), and Mahvi (2003/0036823) as applied to claims 1 and 10 above, and further in view of Nonaka (JP 08-111932 A). Gronbach, Maeda, Akerson, and Mahvi teach a vehicle power distribution system as described above. Gronbach teaches a controller that controls the output of the converters (last of [0012]). Maeda teaches each set of 42V loads each being associated with a DC/DC converter. Gronbach fails to explicitly teach detecting the current required by the loads. Nonaka teaches detecting the power requirement of a load. It would have been obvious to one of ordinary skill in the art at the time of the invention to, via some point in the circuit, detect the current required by

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each load, so that Gronbach's controller will know what voltage to output from the converters to properly feed the loads.

8. Claims 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gronbach (2003/0155814), Maeda (6,340,848), Akerson (6,344,985), and Mahvi (2003/0036823) as applied to claim 1 above, and further in view of Tamai et al. (2002/0190690). Gronbach, Maeda, Akerson, and Mahvi teach a vehicle power distribution system as described above. They fail to teach the use of fuses and switches as protecting means for the loads. Tamai teaches the use of both fuses and controlled switches (22-25) as protection means (Fig. 1). It would have been obvious to one of ordinary skill in the art at the time of the invention to implement fuses and switches into some of the load circuits to include extra protection against overcurrent and overvoltage.

9. Claims 13 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gronbach (2003/0155814), Maeda (6,340,848), Akerson (6,344,985), Mahvi (2003/0036823), and Tamai et al. (2002/0190690) as applied to claims 1, 5, and 6 above, and further in view of Beihoff et al. (2003/0132042). Gronbach, Maeda, Akerson, Mahvi, and Tamai teach a vehicle power distribution system as described above. They fail to explicitly teach the type of switches used as protection means. Beihoff teaches the use of power switches in vehicle systems, such as FETs ([0004]). It would have been obvious to one of ordinary skill in the art at the time of the invention to use FETs as the switches in the above invention since FETs are known to be used in the vehicle art, and the other references were silent on this issue.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dru M. Parries whose telephone number is (571) 272-8542. The examiner can normally be reached on M-Th from 9:00am to 6:00pm. The examiner can also be reached on alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Sherry, can be reached on 571-272-2800 x36. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR

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system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DMP

8-28-2007

A handwritten signature in black ink, appearing to read "MS 9/1/07", is written over the printed name and title.

MICHAEL SHERRY
SUPERVISORY PATENT EXAMINER